

KNOWLEDGE FEDERATION HOLISTIC FRAMEWORK

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Abstract. Quantum-Informational Medicine and Knowledge Federation share a fundamental interest: To develop a *holistic*¹ framework for science and for knowledge work in general, i.e. a framework that does not unnecessarily limit our worldview, but helps us evolve culturally and socially. Knowledge Federation approaches this task directly, by making it a subject of a collaborative ‘game-changing game,’ where we discover and make ‘moves’ whose aim is to change real-life knowledge work practices. This article summarizes eight such ‘moves,’ and extend an invitation to join the work on the larger new frontier that Quantum-Informational Medicine and Knowledge Federation might belong to together.

Keywords: *knowledge federation, systemic innovation, epistemology, cultural revival*

During philosophy's childhood it was rather generally believed that it is possible to find everything which can be known by means of mere reflection. It was an illusion which anyone can easily understand if, for a moment, he dismisses what he has learned from later philosophy and from natural science (...) Someone, indeed, might even raise the question whether, without something of this illusion, anything really great can be achieved in the realm of philosophic thought – but we do not wish to ask this question.

This more aristocratic illusion concerning the unlimited penetrative power of thought has as its counterpart the more plebeian illusion of naive realism, according to which things "are" as they are perceived by us through our senses. This illusion dominates the daily life of men and of animals; it is also the point of departure in all of the sciences, especially of the natural sciences.

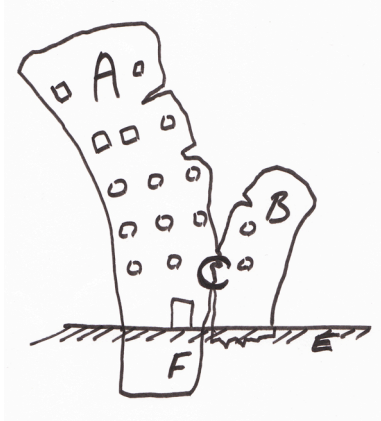
Albert Einstein [1]

1. Introduction

The Quantum-Informational Medicine community and the Knowledge Federation community share a fundamental interest – to develop a framework for science and more generally knowledge work that is not unnecessarily restrictive but *holistic*.¹ Lately we have been pursuing this interest in a common project called Tesla and the Nature of Creativity or TNC [2]. This article will outline the contours of a larger creative *frontier* that is emerging, summarize what Knowledge Federation may be able to contribute, and extend an invitation to join the work on this *frontier*. The modalities of participation will be explained in Conclusion.

In the spirit of *polyscopy* (part of our *holistic* framework, described below), we begin by summarizing the main message of this work in terms of a metaphorical image or *ideogram*.

¹ The word *holistic* here means that we look for a framework for knowledge work that includes all knowledge worth including. This meaning is roughly analogous to what the logicians mean when they say ‘sound and complete.’



The above image depicts our culture or civilization (labeled C) as a house split into two. The larger part A is the ‘mainstream’ culture, represented by the academia. Part B is a part of our culture that rooms vital human and cultural possibilities unacknowledged by Part A. Since B culture it is often considered as secondary to A culture, and pushed to a cultural margin called ‘alternative,’ we will call it the *bystander* culture. Part F, which is under the earth surface E and therefore invisible, represents the *foundations* of culture, and of knowledge work. F may also stand for the academic and cultural *frontier* that is a result of this condition. D is what is missing – a new kind of ethical sensibility we will be calling *design*.

The message of this *ideogram* is that our civilization or culture is in danger of falling apart because its *foundations* are incomplete – not capable of holding the whole culture, and not providing a foundation for some of the parts that are needed to make it whole. When we look only at what exists above the ground to decide what work is there to be done, then building further either in A culture or in B culture seem to be the only options. But there is a third option – what we called the *frontier* – and that is to rebuild the *foundations* and continue building on this much more solid ground. Calling it ‘the frontier’ feels appropriate because – as illustrated below – it is a uniquely fertile academic space (the academic work that needs to be done there is in a proper sense *fundamental*), and at the same time it is an urgent practical need, being what our culture needs in order to recover and become whole, and able to evolve further. The rest of this article will illustrate what the work on this *frontier* might be like concretely, by describing several prototype projects we have undertaken to point at a much larger space of possibilities.

The following big picture view will further explain the above image and motivate this work.

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“Give me a place to stand and I shall move the world,” said Archimedes to highlight the power of the lever. During the ensuing twenty-two centuries our mechanical devices have become so powerful that we can now alter the biophysical condition of our planet – or in a sense ‘move the world’ – but not necessarily in a good direction! Authors too numerous to quote, representing disparate backgrounds and worldviews, observed that our future now hinges critically on our ability to evolve culturally and socially fast enough, to a condition where we are capable of handling the power of technology meaningfully and safely.² This leaves us with the challenge to find another kind of ‘lever’ – which might help us ‘move’ forward the *human* aspects of our world, namely our society and culture, and develop them, and ourselves, in this century with similar vigor as we developed science and technology in recent past.

If this task, to ‘change the world,’ might seem overwhelming, the good news is that we already have a leverage point that offers us sufficient power: It is what we are calling our culture’s *foundations*, i.e. the usually unstated assumptions based on which facts are established and worldviews are created. Our beliefs and values, our scientific method and the way we see the world, the way we determine our priorities and act, and ultimately our culture and the world we are able to create, all stem from our culture’s *foundations*. During the 19th century *foundations* were

² For example Aurelio Peccei, the founder and first president of the Club of Rome, dictated to his secretary shortly before he would pass away: “Human development is the most important goal.”

developed that relied on construction of causal, mechanism-like models of the natural world, in terms of so-called ‘scientific’ concepts, and accepted as possible or true only that which could be explained by such models. Results in 20th century physics, however, constituted a rigorous scientific disproof of those *foundations* — as Werner Heisenberg carefully explained in *Physics and Philosophy* [3]. He concluded:

“In this way, finally, the nineteenth century developed an extremely rigid frame for natural science which formed not only science but also the general outlook of great masses of people. This frame was supported by the fundamental concepts of classical physics, space, time, matter and causality; the concept of reality applied to the things or events that we could perceive by our senses or that could be observed by means of the refined tools that technical science had provided. Matter was the primary reality. The progress of science was pictured as a crusade of conquest into the material world. Utility was the watchword of the time.

On the other hand, this frame was so narrow and rigid that it was difficult to find a place in it for many concepts of our language that had always belonged to its very substance, for instance, the concepts of mind, of the human soul or of life. (...) It was especially difficult to find in this framework room for those parts of reality that had been the object of the traditional religion and they seemed now more or less only imaginary. (...) Confidence in the scientific method and in rational thinking replaced all other safeguards of the human mind. (...)

Coming back now to the contributions of modern physics, **one may say that the most important change brought about by its results consists in the dissolution of this rigid frame** of concepts of the nineteenth century. Of course many attempts had been made before to get away from this rigid frame which seemed obviously too narrow for an understanding of the essential parts of reality. (...) Only experimental research itself, carried out with all the refined equipment that technical science could offer, and its mathematical interpretations, provided the basis for a critical analysis—or, one may say, enforced the critical analysis—of those concepts, and finally resulted in the dissolution of the rigid frame. (Boldface is added by this author.)

Similar fundamental insights were reached in other academic disciplines. Maturana’s results in biology of cognition, Berger and Luckmann’s results in sociology of knowledge, Wittgenstein’s contributions to philosophy of language, Kuhn’s contribution to philosophy of science, Lorenz’s insights into the ‘chaotic’ nature of nonlinear dynamical systems and Turing’s landmark result in non-computability showed respectively that our mind is not an objective recording instrument (‘*camera obscura*’) as it was believed but that it *constructs* the picture we see; that our reality picture is also *socially* constructed; that our reality pictures are constrained by our language, which embodies our cultural point of view; that science is not producing a single true reality picture but a multiplicity of models that are *incommensurable* with one another (show different sides, apply in different circumstances); that exact and complete models of reality cannot be created; and even if they could, that their consequences would not be computable. Those insights made it clear that although it brought us a spectacular development of science and technology, the mentioned ‘reductionistic’ approach to knowledge cannot serve as *foundations* for entire knowledge work and culture.

Hence we have reached a condition where a radical change of culture is immanent, because its very *foundations* must change!

We reached this pivotal point of change more than a half-century ago (Heisenberg published his monograph in 1958), and we seem to be still standing there. Our intellectual tradition has not changed its fundamental premises and its manner of evolving as Heisenberg predicted. The academia has largely preserved the same approach to knowledge and a similar mental stance. Enormous increase in production of knowledge we have witnessed in recent decades mainly brought us more of the same.

What remains for us now is to find a new kind of ‘lever’ – which might help us move our *culture* out of this stalled condition.

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Quantum-Informational Medicine undertakes to work on this lever by extending the conventional scientific *foundations* with insights, methods and language of contemporary physics, and then using the resulting *foundations*

to broaden the range of phenomena that can be studied and understood scientifically. Since this broadening of *foundations* has opened up a uniquely fertile space for knowledge work and for culture to expand into, quantum-informational medicine has emerged as a premier cultural lever builder.

But there is still more that can be done:

- as we have just seen, we cannot hope to *found* everything worth knowing on scientific explanations, even when they are extended by the worldview and language of quantum physics;
- the logic and the language of quantum physics are not accessible to most people;
- since the cultural *foundations* give power to worldviews, academic departments and whole industries, attempts at broadening them may be simply ignored.

Seeing in this issue of *foundations* for knowledge work an academic question par excellence, and an urgent societal need, at the University of Oslo we have been working on it since 1995, in ways that complement the approach of Quantum-Informational Medicine. Initially, this work was focused on another way to extend the scientific method: We showed how the approach to knowledge that was developed within the sciences can be made general – applicable to questions that are beyond the boundaries of conventional disciplines, and suitable for providing a *holistic* vision to society. Realizing that the framework that resulted also provided a foundation for a different and more inclusive approach to academic work, we later undertook to map the resulting academic space by developing a portfolio of new research directions that can be developed on it [4,5]. During the past several years this work morphed and cross-fertilized with several related initiatives, which in 2007/2008 led to Knowledge Federation.

Knowledge Federation developed based on the observation that various information technologies that have been developed now make it possible to bring innovation to a whole new, *systemic* level: We can now develop radically new systemic solutions for the main branches of knowledge work such as science, education, journalism and governance, by using new technology as connecting and building material [24]; we can develop new ways of doing and organizing knowledge work from the *foundations* up! In the context of our metaphor, Knowledge Federation is envisioned as Archimedes' "place to stand." It is a community and project where knowledge workers and other stakeholders can come together and do the work on rebuilding the cultural *foundations* and the culture itself simply by self-organizing in new ways.

The purpose of this article is two-fold: (1) to illustrate the potential of this 'place to stand,' both academic and transformative; and (2) to systematize and summarize (or *federate*) what we have done so far and make it available as construction material for building further. We do that by organizing our related work in terms of eight basic *foundations*-related challenges that may need to be addressed.

2. Rebuilding the *foundations*

As Igor Kononenko demonstrated in his QIM 2011 article [7], and as the rest of us might agree – the world spiritual and healing traditions often reached similar or same conclusions, in fine detail and with striking accuracy. Is this pointing at knowledge worthy of our consideration? Do we really need to explain things that are recurrent in experience as consequences of causal scientific models before we can give them an official stamp of existence?

As we shall see next, the mentioned 20th century fundamental insights now allow us to create a *foundation* for knowledge work that is inclusive or *holistic* – which allows us to turn sensible observation like the one above into an *academically* rigorous method. Here is roughly how this might work.

Since, as we have seen, the approach to truth that relies on 'reality mechanism' has been discredited by 20th century science, and since even the apparently universal axiom that 'truth' means 'correspondance with reality' can now be seen as a product of illusion, an obvious alternative is to *found* facts and insights not in a reality picture but in experience. While the spiritual and healing traditions and various contemporary therapy schools might differ vastly regarding cosmology and language, their shared *experiences* can provide us a solid basis for conclusions.

But there is a catch: What we need is a rigorous and universal *foundation* – that is, one that does not depend on *any* assumptions that may be a disputed. The above approach does not reach that goal. Already the statement

that truth does not or should not mean 'correspondence with reality' can be contested. And anyhow, saying it as a statement about reality is *already* self-contradicting!

The way out of this difficulty is so simple that its point is often missed: It is to make the above statement, and also other similar statements, not as axioms about the nature of reality, but as a convention. A convention is a statement similar to 'when I say *X*, I mean *Y*'. A convention is analogous to a contract – it is something that can be read, agreed on and used for communication – or found unsuitable and not used; but its factual content cannot be disputed, simply because there is none. Hence convention making gives us a possibility to create a *foundation* for knowledge work that is free of potential controversies and hidden assumptions.

(I should clarify at once that making such a convention is not an academic exercise, on the contrary. In informatics and computing it is standard to use such conventions as basis for practice, Object Orientation being a familiar example, and I submit that the case might be similar in knowledge work as well. Furthermore, as discussed below, the issue of *foundations* for knowledge work is not only academic but also political, in the sense that it has to do with a variety of power relationships. A constitution is an example of a society-wide convention. One of my main points is that since the *foundations* for knowledge work can no longer be considered as God-given, they need to be made an *explicit* part of the 'social contract.')

We called this sort of convention '*methodology* definition,' and we created a prototype *methodology* called Polyscopic Modeling or *polyscopy* to illustrate this approach [7,8]. The Polyscopic Modeling *methodology* definition [9] consisted of eight simple clauses called *postulates*. The rest of the Polyscopic Modeling *methodology* provided suitable methods and example results of their application that were developed based on this *methodology* definition as foundation.

Polyscopy demonstrated how the *methodological* approach can allow us to turn some of the key insights and ideas that had been expressed earlier by for example Gregory Bateson, and other methodological innovators who saw what was basically going on, into a simple and clear social convention, free of ambiguities and contradictions.

The first result of *polyscopy* showed how its methods can be applied to create an insight about the paradoxical nature of human wellbeing, by combining – or as we would now say *federating* – experiences and insights reached in a variety of therapeutic, spiritual and other traditions, including the sciences [10]. The *methodology* definition allows us to use those heterogeneous experiences and insights in a similar way as witnesses are used in a legal procedure – to give credibility to a shared conclusion.

One of the *postulates* of *polyscopy* states that *information* reflects experience, not reality. Another one states that experience has no a priori structure. In *polyscopy* experience is considered (by convention!) as something like an ink blot in a Rorschach test – namely as something to which we are free to *attribute* meaning. This not only frees us from the bonds of old conceptual and metaphysical schemes, but it also allows us to develop something that is (I submit) our society's vital need – the ability to see and understand things *together* in completely *new* ways!

At the founding meeting of European Scientific Holistic Medicine conference in 2004 in Copenhagen we submitted – using Aesop's Fox and Stork fable as metaphor – that trying to *found* holistic medicine, or anything holistic, on conventional science as foundation has a better alternative in first rebuilding the *foundations*[11].

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Knowledge Federation introduces to the age-old work on *foundations* for knowledge work a completely new dimension – the Web. Credibility of a claim can be augmented already by making it visible on the Web and allowing people to comment. But a lot more can of course be done.

3. Liberating knowledge work

An obvious constraint on the kind of knowledge we can create – and an obstacle to *holistic* thinking and action in general – is what Heisenberg called “rigid frame,” namely the concepts and methods of conventional disciplines. How can we overcome this obstacle?

At IPSI transdisciplinary conference in 2003 we motivated *polyscopy* by telling the old joke about searching for the lost watch under a street lamp [12]. The point was that our conventional disciplines are like those street lamps in the joke – by their choice of questions, methods and terminology they allow us to see certain things clearly, but also limit what we can see; and there is a large crowd of people looking for knowledge under each of them, exploring every inch of the terrain that is illuminated by the discipline. But what about the rest? What if what we really need to be looking for is not found under our lamp? Or under any of those lamps?

Polyscopy undertakes to overcome this problem by creating a *general-purpose* method for knowledge work, which can be applied in principle to any question or issue. This method relies on a technique called *scope design* (free and conscious creation of suitable ways of looking or *scopes*). In the light of the above metaphor, *polyscopy* may be understood as a portable searchlight, which can be taken into the dark and pointed at whatever one wants to see and examine.

This general-purpose method is created by generalizing the conventional scientific approach roughly as follows:

- a way of looking or *scope* is created – usually by defining the key concepts by convention;
- the *scope* is given to the reader together with a certain claim, which is characteristically a statement about how the things are related with one another or a *pattern*. If by looking through the provided *scope* the reader sees what is claimed or the provided *pattern* in experience, then this 'communication experiment' is considered successful.

This method enables us to 'prove' (*polyscopy* would say *justify*) practically any type of statements, including ethical and even emotional ones. And to extend the dry language of science with the colorful language of art and metaphor, *without sacrificing rigor!* [13]

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As we shall see, Knowledge Federation extends this work on development of new methods by creating new socio-technical processes by which researchers from different disciplines, 'the crowd' and the media workers can cooperate to co-create, organize, evaluate and share reliable and verifiable facts and insights.

4. Reorienting knowledge work

Not only the practices and the methods in conventional knowledge work, but also the choice of subjects and values have developed within an effort to create an objective reality picture. How can we overcome *this* limitation?

The general approach proposed above – to base knowledge work on a written convention or *methodology* – allows us to specify also an overall *purpose* as a convention; and to then define suitable criteria – what information and knowledge work need to be like to serve the intended purpose. Notice that this is not a restriction – other *methodologies* can be defined for the same and other purposes.

The choice represented by *polyscopy* is to ask: What sort of knowledge might make the largest positive difference to contemporary people and society? And to develop knowledge work practices that can provide such knowledge [14,15].

Polyscopy, or more specifically convention making, allows us to also define language terms by convention (they are written in italics). Two such terms were coined to pinpoint this new direction: *tradition* and *design* are defined as two alternative approaches to making things whole [16]. *Tradition*, by convention, relies on spontaneous, Darwinian-style evolution in culture; *design* means consciously taking responsibility for wholeness. A key insight is that whenever *tradition* is no longer in place or can no longer be relied on to bring us to wholeness, *design* must be used. *Polyscopy* calls the purpose it is created for *information design* – which means creating information needed to make things (our culture, ourselves...) whole.

In accord with its chosen purpose, *polyscopy* defines a set of criteria, specifying what information needs to provide to serve the designated purpose. The single conventional criterion – 'factual truth,' which reflects the old intuitive epistemology, the 'correspondence theory,' – is replaced by four new ones (four of the eight *postulates*

are criteria). A criterion called *perspective* states that *information* must be able to give an accurate picture of the whole (situation, or phenomenon), with nothing distorted or hidden.

It can easily be seen that to provide a clear and correct *perspective*, *scope design* (creation of suitable new ways of looking) must be used.

In the light of the metaphor of searching for the lost watch under a street lamp, both *information design* as orientation and *perspective* as criterion are basically saying 'Go search in the dark!'

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Knowledge Federation is self-organizing as a *transdiscipline* where the *design* of knowledge work can be developed and practiced [17].

5. Providing insights

What could information provide us that is now lacking? In what way could that make a large difference to our society and culture?

Perhaps the most important distinction of the vision for knowledge work that is made concrete by *polyscopy* and Knowledge Federation is that it supports the creation of community-wide basic insights. "Our car is having a flat tire" is a textbook example of an especially useful kind of insight which *polyscopy* calls *gestalt*. A *gestalt* is an interpretation of a situation, which points at a suitable course of action.

It should go without saying that reliable and shared *gestalts* about key issues are what knowledge work needs to be able to provide to society.

At Visions of Possible World Conference at Politecnico di Milano in 2003 we presented a vision of a sustainable world where suitable (democratically created, reliable, transparent...) big-picture views are used routinely to orient and motivate action [18].

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At a recent miniworkshop that Knowledge Federation staged at Stanford University [19] we motivated Knowledge Federation by the teaser *gestalt* "Knowledge work has a flat tire!" We justified this *gestalt* by pointing at an example showing that our current social organization of knowledge work *inhibits* the creation of community-wide insights about critical issues [20]. Simply continuing business as usual – by focusing on production – would be like trying to rush ahead by pressing the gas pedal in a car with a flat tire; our situation calls for stopping and taking care a systemic problem.

But what might a remedial practice be like? To orient the quest, we gave this remedial practice a name – we called it 'knowledge federation' (we use small letters to point at the practice), and here is why: A political federation unites geographically and culturally distinct units (states) into a shared larger unit (the federation), while aiming to resolve the tension between the need for autonomy and the need for strong union, and ideally turn it into synergy. Knowledge federation undertakes to do something closely similar with knowledge resources. In this analogy, the role of the states is played by the now independent, scattered and disharmonious knowledge resources, while the role of the federation is played by a shared, community view of an issue. The work of Knowledge Federation begins where the conventional knowledge work ends – publication of individual documents and opinions – and undertakes to organize them together and either produce a shared, community view (i.e. a *federated* view), or (where this might be impossible) to make it easier to the reader to form such a view themselves. A basic insight that motivates Knowledge Federation (as the community dedicated to developing knowledge federation theory and practice) is that this work cannot be done by an individual, and that the creation of meaning will not be done by technology alone either. The solution will need to be a *socio-technical* process (human acts and social processes enabled by suitable technology, which of course does the part of the work that the technology can do).

Knowledge Federation undertakes to develop this process and put it into practice.

Like political federation, or democracy, knowledge federation brings a suitable new set of values to knowledge work, whose aim is to reduce the mental and cultural 'pollution' and to restore clarity and quality. Part of the task of Knowledge Federation is to develop a knowledge work culture.

6. Democratizing knowledge work

Large changes have often resulted from a new way in which the basic issues of freedom and justice are perceived. Is information in today's society really free? Are *we* really free? Are our contemporary versions of democracy and of free press the final solution to humanity's quest for a just society? Or is there still an insight that might inspire a large systemic change?

With the help of *scope design*, we developed a new and unconventional way of looking at the issues of power and freedom – by modeling the intuitive notions 'power holder' and 'political enemy' as *power structure*. The *methodology* allowed us to make this notion precise [8,14]. What follows is a brief, intuitive description.

Typically, a *power structure* will not be a conspiracy or a clique of powerful men (although it might be that), but a structure consisting of ordinary people, and their values and ideas, and various career and other interests, who are not even aware of the *power structure* they compose together. The power is perceived as not necessarily an attribute of any of the constituent persons or identifiable entities, but primarily of the relationships they form together.

A *power structure* is a structural defect in the living tissues of a society, akin to a societal cancer, growing of its own accord, damaging the function of the affected organ affected and sapping the vitality of the organism – while being unrecognized by the societal 'immune system,' and treated in the same way as other, healthy tissues. Aberrations in American 'financial services industry' and government revealed by the 2008 financial crisis, and recently revealed defects in American and British public informing are prime examples of *power structure*. But they are not at all the only ones.

At the yearly conference of European Association for the History of Medicine and Health in Paris in 2005, we posed the question whether healthcare too can develop cancer, and we answered it positively by pointing at *power structure* tendencies [21].

A common symptom of *power structure* is that people are overworked and busy, and yet the social purpose of their work is not adequately served. The reason is that a lion share of effort is invested into spinning the wheels of a dysfunctional social machinery, or into competing within the *power structure* or with other *power structures* – an engaging pursuit in which the larger purpose is all too easily forgotten.

The *power structure* view can help us explain why knowledge work remained as it is in spite of mentioned fundamental insights. It allows us to place the work with *foundations* into a new, political context.

The *power structure* view also provides us a simple way to understand sustainability and other contemporary issues.

Technically, a *power structure* is not a thing, but a way of looking or *scope*, which allows us to perceive *power structure* tendencies in otherwise good and useful societal organs and tissues. If after training your sight a bit you end up seeing *power structures* everywhere, don't panic – some of the basic insights that result from the *power structure* view are really good news:

- The *power structures* are consuming or wasting so much of our vital resources that, if this problem can be remedied, our material condition might improve quite dramatically. While a more detailed report is being prepared, here is a way to reach that insight on your own: Watch the Oscar winning documentary *The Inside Job*, and the earlier one called *No End in Sight* by the same authors (both are available online); they will show why the 2008 bailout and the Iraq war are in all likelihood orchestrated by the same *power structure*. Then take a look at the Billion-Dollar-o-Gram [22] to compare the costs of those two events with the projected costs of resolving some of the common global issues such as 'saving the Amazon' and 'helping developing nations combat climate change.' Take into consideration that what you are looking at are the effects of a *single one* (albeit perhaps the wealthiest) among so many identifiable *power structures*!

- The *power structure* view radically changes the name of the game in politics – from 'us against them' (rich vs. poor, Capitalism vs. Communism, Republicans vs. Democrats...) to 'all of us against the *power structure*.' Indeed, although some of us may feel attracted to the apparent power that the *power structure* has given us (it is apparent because it lasts only as long as we serve the *power structure*), in an informed society the fact that the *power structure* tends to hinder even its most powerful individuals from reaching wholeness may become shared and obvious.
- And now the main point: This societal cancer has an obvious cure! It is – self-organization. The remedy that can bring this cure is the change of ethics from seeking personal advantage within the existing societal structures (which is the glue that binds us to *power structure*), to doing what best serves the wellbeing of larger social and natural organisms and their various organs (i.e. which brings *wholeness* on all levels).

'*Design*' as we defined it above ('taking responsibility for *wholeness*' or 'stewarding *wholeness*') is a name we have chosen for this remedy; and *tradition* – the ethics and behavior that once served us well, while we were living in functioning traditions – is what now bind us to *power structure*.

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If we diagnose that *power structure* is our society's cancer-like disease, then Knowledge Federation may be understood as a way to bring cure to our society's brain and immune system – and thus enable the society to cure itself. A core goal of Knowledge Federation is to foster self-organization in knowledge work. At the opening of the second Knowledge Federation workshop in Dubrovnik in 2010, where the present Knowledge Federation began to take shape, the participants – representing a suitable mix of backgrounds and interests to enable this sort of work [23] – were invited to perceive themselves not as people pursuing a career in a chosen profession but as elements in a collective mind – and to self-organize as it might best serve this role. During the three days of the meeting we began to work on systemic solutions for journalism, science and education.

There are several ways how Knowledge Federation may contribute to cure, such as:

- By employing the power of the Web and the new media to develop new systemic solutions. The power of the Web to democratize knowledge and knowledge work is well known – the Web has enabled in principle everyone to broadcast to the world! Furthermore – as numerous examples such as Google and Facebook have shown – the Web can generate enormous power with minimal initial investment. Therefore the Web is ideally suited for creating new, benign *power structures* that can outperform the malignant ones, and bring cure.
- By employing the power of the Web and the new media to empower good culture. Andrew Kohen's observation that 'the Web has disintermediated the expert' is true only partially – the academia has to a large extent disintermediated itself, by defining itself as a collection of traditional pursuits and ignoring the emergence and power of the new media. Similar statements could be made about literature, arts and other constituents of 'good culture.' In Knowledge Federation we undertake to implement the core functions of good culture in the new media. At this moment, for example, we are preparing our next workshop in Barcelona titled "Co-creating an Innovation Ecosystem for Good Journalism."
- By developing suitably designed (to provide 'checks and balances') and *transparent* solutions for knowledge work.

7. Recreating knowledge work

Academic criteria for promotion and funding support the disciplinary interests and pursuits. How can we empower this new way of working, and allow it to develop?

(Before we look into this question more closely, observe that the *design* approach to academic work empowers us to turn this question into an *academic* problem: As scientists working under the *design epistemology*, as we have been calling the above-described *foundation*, we are no longer those passive or

'objective' observers we used to be; we are actors, conscious participants in the changing world. When in academia we perceive ourselves as a service to society in need for suitable knowledge, then changing the actual knowledge work becomes one of our core tasks.)

In Knowledge Federation, recreating the practice is an explicit and conscious goal. Since its second workshop in Dubrovnik in 2010, Knowledge Federation has been self-organizing as a 'game-changing game' – a collection or *federation* of semi-independent projects, each of which undertakes to be game changing in its own domain. Together, those projects compose Knowledge Federation as a general or generic game-changing game [24].

Knowledge Federation projects provide just enough structure for the participants to be able to employ their time and skills productively. But our core task is to discover and make 'moves' that can be game-changing.

Power structure being such a powerful opponent, we employ an approach similar to the one that is often associated with Judo – using the inclinations and energies that are already there, and deftly orienting them in a new direction.

A detailed description of various strategic points and moves is beyond the scope of this article, and we here provide only some taste bits:

- The emergence of the computer once led to the development of computer science and to manifold developments within *computer* system design and related innovation; the Web and the new media now invite R&D and innovation to ascend to a whole new level – *socio-technical* system development, in diverse areas of knowledge work such as education, journalism, science and governance. Specifically socio-technical system development could be the next interest for people working in various knowledge work technologies such as Semantic Web, Topic Maps, Dialog Mapping and others – as a way to bring the existing technology into actual practice. The first Knowledge Federation workshop in Dubrovnik in 2008 was a convention of researchers working on socio-technical solutions for collaborative knowledge work. We realized, however, that to truly bring this work into practice, a heterogeneous community, a federation of knowledge workers, will need to be formed. Knowledge Federation has been conceived as an organizational site where such a development can take place.
- It is a safe bet that the existing large socio-technical systems for knowledge work will change in the near future: Our children and our students are socializing, playing and enjoying – and creating – media material and entertainment by using the state of the art networked digital technology. When they become for ex. academic researchers and instructors – why would they continue using the procedures that have been developed based on articles, books and classrooms as the only available technology?
- The Knowledge Federation Course project is developing a federated university course model and a university course, scheduled to be offered in the Fall of 2012. In a federated education, where the learning resources are developed and maintained through collaborative work of a global community of researchers, the economies of scale enable completely new patterns of work. When an author is responsible only for a single lecture or part of a lecture (or whatever else will emerge as basic unit of education), and can cooperate on it with creative film makers and animation and visual artists who are also members in the federation, then completely new possibilities open up. Acquiring in this way access to new media technology, education becomes capable of competing with the gaming industry for the interest and attention of young people. The Knowledge Federation course will be offered to selected graduate students from some of the leading global universities (through Inter University Centre Dubrovnik, which is accredited to offer such courses). This course will enable students to begin a career in knowledge federation, and more generally – to join the *frontier*. The Knowledge Federation Course project brings *design* to education – and aims to take care of all core functions, not the least instilling creative and cooperative values and work habits.
- The operational goal of Knowledge Federation Stakeholders project is to secure funding; but the 'game' it enacts is quite a bit more interesting than it might seem. This project is currently in two parts. The task of the first one, the Corporate Stakeholders project, is to develop and extend its rather unique value proposition to suitably chosen companies.³ The task of the second one, which is called Proactive

³ Here is a hint that points at the substance of this value proposition: While Blizzard Entertainment was able to create World of Warcraft, no software manufacturer can create a new 'academic game' or 'journalism game.' Researchers and journalists

Donorship project, is to make a large donor interested in supporting a project that approaches the contemporary issues in a *systemic* way (...).

- Knowledge Federation's value proposition to its members is an answer to what we consider to be *the* contemporary dilemma: "How can we contribute sufficiently to making the world safer and better for our children, while continuing our normal life and careers?" Knowledge Federation answers this question by producing a *synergy* between the personal career goals, and those global and long-term ones.

8. Changing our collective mind

We have now come to a subtle yet central obstacle to *foundations* change. Have you experienced that, when talking about religion or politics, or about the sort of themes that are represented in Quantum Informational Medicine, your interlocutor denies your view even before hearing your arguments; or even worse – that he stops listening while you are just beginning to make point? As Antonio Damasio showed [25], our decisions and choices are often not conscious but *pre-conscious*. We have been *socialized* to accept certain beliefs as true and certain practices as normal, even when they are not. And when our mind is facing an idea that contradicts its pre-conscious beliefs, its inclination is to simply ignore it.

How can we then ever hope to change our collective mind, when even our individual minds might pay attention only to that which our collective mind has prescribed?

A creative solution was developed by physicist David Bohm; he devised a technique he called Dialogue [26]. In a Bohmian Dialogue people sit in a circle and do two forms of practice:

- Supportive listening – while one talks, everyone listens without talking or judging. While we are listened to in this way, thoughts may emerge that even we did not know we entertained.
- Self-observation – observing one's own inward emotional reactions. When we practice self-observation, Bohm noticed, we become aware that our reactions tend to be incoherent with our consciously held values and beliefs. And this simple act of observing then also tends to correct our pre-conscious beliefs because, Bohm claimed, coherence is its inner nature.

Experience showed that when a dialog is successful, the result is coherence within the group. Instead of competing with one another, the members of the group begin to co-create. A reward is increased sense of togetherness and joy.

We adapted Bohm's Dialogue and developed a technique called Key Point Dialog (*a key point* is a value- and direction changing collective insight), by combining it with a therapeutic technique called intervention, and by adding the Web and the informing media. We applied the resulting procedure in practice by organizing an event called The Cultural Revival Dialog – Building the Future of Europe Together [27], in collaboration with European Movement Croatia, as part of the celebration of the 60th anniversary of the European Movement International. The specific modifications of Bohm's original idea were as follows:

- The circle was composed of opinion leaders (politicians, journalists, artists and public workers, academic researchers and others).
- The circle was surrounded by four chairs with 'tacit invitees,' four 20th century authors, each represented by a large, framed photograph and two books. Symbolically, they represented the four walls defining the context for the dialog, which was the context of the 21st century (the 'tacit invitees' were placing us into the context of 21st century by making us aware of some of the insights that were reached during the past century).

must do this change themselves. But they of course cannot do this alone. At the very least they need the experts who can creatively use the new information technology; ideally they should be the people who are developing technology for collaborative knowledge work; and then they will probably also need business planners, and entrepreneurs, and people who innovate in presentation of insights by using visual media... Knowledge Federation positions itself as an *enabler* of systemic innovation [23] – by being a *federation* of knowledge workers representing relevant kinds of expertise *and* by providing a way (self-organization or 'bootstrapping') in which they can cooperate together and create solutions.

- We provided Internet and media support. If and when the circle would begin to resonate with the *key point*, we would allow the resulting waves to spread through the Internet and informing media (the dialog would be allowed to continue in the media).
- Into the middle of the circle (symbolically) we placed Sheng Szen Qigong ('Qigong of Unconditional Love'), represented by its Headmaster Li Jun Feng and his daughter, Li Jing, who is working on a Ph. D. dissertation about qigong at a university in Sweden. (Metaphorically, this was like throwing a rock into the middle and creating waves).

Master Li Jun Feng and Ph.D. Candidate Li Jing embodied experiences that challenged our conventional *foundations* and worldview, and pointed at human and cultural possibilities that reside beyond them. Conceivably, some of our participants may have been tempted to disqualify Sheng Zhen Qigong as pre-scientific and leave the circle, in any case mentally. But Werner Heisenberg was a 'tacit invitee' in one of those chairs surrounding the circle, representing the insight that – for all we know *scientifically* – qigong *is* possible! And Aurelio Peccei was in another chair, telling us that Sheng Zhen Qigong is pointing at exactly the sort of cultural possibilities that might be necessary for the continuation of our civilization.

The described additions turned the original Bohmian dialog circle into a high-energy site akin to a particle accelerator, capable of raising the energies to the point where change of mind has become possible.

*

In Knowledge Federation we continue to organize similar dialogs within the Tesla and the Nature of Creativity project, which is described next.

9. Changing knowledge work practice

This is all fine, but how can our ideas and solutions leave the laboratory and recreate the knowledge work *practice*?

As already mentioned, Knowledge Federation has self-organized to become a 'game-changing game' – inventing game-changing 'moves' is our explicit purpose! What we present are strategic 'moves' that are being developed within one of our projects called The Tesla and the Nature of Creativity.

Tesla and the Nature of Creativity (TNC) [2] is the project where work in Quantum-Informational Medicine is combined with work in Knowledge Federation. The scenario is that we take a result in quantum-informational medicine and federate it. The result is Dejan Raković's model of the inner workings of 'deep creative insight,' a phenomenon reflected in a highest degree by famous inventor Nikola Tesla. By federating this result we showed how any technical result of general relevance and interest may be federated i.e.:

- explained in terms that are accessible to general public,
- expressed as an idea in an idea graph and made available online for everyone to comment and work with,
- linked with other related ideas and results,
- developed into general insights that can inform policy- and lifestyle change,
- brought to the attention of academic and other communities where it may have large impact,
- brought to the attention of the media and the public.

Since the TNC project is described in another article in QIM 2011 Proceedings [2], we here highlight only some of its strategic 'moves' that that might contribute to a change of practice. We use suitable metaphors to highlight the strategic points.

- **Candles vs. light bulbs.** By showing a systemic innovation that is obviously superior to conventional practice, we may produce an effect similar to contrasting an electrical light with a candle – make it obvious that the future will have to follow the indicated direction.
- **Court and court case.** To change the knowledge work practice, we apply a strategy similar to the one used for changing the *legal* practice in the USA and Canada: A certain specific law suit is carefully prepared and taken all the way to Supreme Court (an example is the court case that tobacco industry lost

recently at the Supreme Court of Canada); this then makes it easier for other similar lawsuits to succeed. In the TNC project we develop a case for quantum medicine and the corresponding worldview by focusing on a specific academic result – Dejan Raković’s model [28]. (A subtle point here is that Knowledge Federation initially needs to be both the lawyer and the court – or better said the court-building project. Even when we might be personally wishing that the new view of creativity gain acceptance, we emulate the traditional neutral and sober stance associated with good science, aiming to develop a socio-technical procedure that will enjoy a similarly high esteem as the jury trial now enjoys.)

- **Creativity as Trojan horse.** The phenomenology of creative insights is supported by research and numerous testimonies, and so well documented that it seems impossible to rationally deny it. But the structure of the result federated suggests a more general insight: The nature of something that is quite central for culture (creativity) has been misunderstood and ignored, because it failed to fit into what was erroneously conceived as ‘scientific worldview.’ Are there other phenomena that were similarly misunderstood and ignored? Hence our creativity case opens the door to a number of other phenomena to be seen and given citizenship rights.
- **Snåsamannen 2.0.** We have planned to stage a Knowledge Federation Dialog in Norway, where the public is already sensitized to the larger issue we are talking about through books and public events related to Joralf Gjerstad, a person with alleged healing and clairvoyant abilities, who became a celebrity in Norway after his biography became the bestseller. The first round of debates caused a rift between the academia and the public, endangering the public esteem of science [29]. Our intention is to create a second series of events, where this rift will be repaired (recall the *ideogram*).

10. Conclusion

We have seen a way how *foundations* for knowledge work may be made that are close to being *whole*, and several examples of new questions and ways of working that may be developed on this new *foundation*.

To highlight the larger *academic* frontier that both Quantum Informational Medicine and Knowledge Federation may belong to, and to point at the work that is opening up for us to do in the future, we now summarize what has been said by yet another big picture view or *gestalt*. The developments that were taking place in the arts a century ago will provide a suitable metaphor: It was then that the artists understood that ‘objectively depicting what was seen in reality’ was not really what art was or needed be about. A myriad possibilities for creative action, and numerous new styles and directions, developed from this insight. Our possibility, and arguably also our obligation to our intellectual tradition and society, is to begin a similar development in the academia, and in knowledge work in general.

It is instructive to see also how the *value system* of the art *academy* changed: Standards of excellence that were based on mirroring nature by imitating the technique of Old Masters became obsolete; something quite different began to be recognized as ‘contemporary art.’ After this change happened, to become members of an art academy, artists needed to be creative also in the very way in which they were doing their art. It was no longer the artists’ skill in following an established pattern that distinguished them as artists, but their ability, and even their courage to challenge and recreate those patterns.

If it might indeed be true, as Aurelio Peccei claimed, that our most urgent need is a comprehensive cultural change,⁴ we can now see how such an event might develop in a natural way – in the academia, where we are not bound by the sort of pressures that the industrial workers have (unless we impose them on ourselves unwittingly); and where the young people we are instructing can begin their professional lives with a larger worldview and inspiration for creative action. All we need to do is provide suitable space where vital new impulses can develop, and demonstrate suitable spirit. Knowledge Federation attempts to be a step in that direction.

The need for reexamining and changing the *foundations* for knowledge work, by which we motivated the described work, empowers us to carry out large changes in academia not as a revolution, but as *evolution* – although the resulting developments might seem like a revolution, as indeed our circumstances might require.

⁴ “The future will either be the inspired product of a great cultural revival, or there will be no future.” [30].

Courage and humility are required of us who undertake to work in this way. Courage – to see that what was academically considered as most solid and relevant in the past will not necessarily be that in the future; and humility – to see that much of what has been created in the past *will* be relevant, and perhaps even acquire new relevance. Our challenge is to open up this new academic space, where creating new *foundations* for knowledge work is seen as our core task (or as ‘basic research’), and on this new space make sure we import and learn from the past (i.e. *federate*) what is still vital. And that we then develop work that is as solid and as deep as the work that has been done by our great academic forefathers, which earned our profession the public esteem that we now enjoy.

To work on this new frontier, it is of course not necessary to join Knowledge Federation. It is sufficient to work under the ethical stance we called *design*. (This name is, of course, arbitrary and it too can be *federated*. There are already a number of people and communities who claim that the key to our condition is ‘the spiritual outlook on life’. And there are others who claim that it is ‘holistic thinking.’ Both notions are closely similar to *design*.) *Design* can be practiced in any profession, and in all walks of life.

On the other hand, Knowledge Federation is just beginning to develop and grow within the new structure that has been described; it is now ready to receive new members who will want to work on the *frontier* by participating in our ‘game-changing game.’ If you might be one of them, please contact us at knolfed@googlegroups.com, while our new Drupal-based community site KnowledgeFederation.net is being completed. For more information about our on-going projects visit <http://KnowledgeFederation.org>.

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